

Tanta University	3 rd year, Computers & Control Dept.
Faculty of Engineering	Digital Signal Processing

Sheet 4

1. Find the Z-transform for the following functions:

i. $x(n) = (-1)^n$

ii. $x(n) = \delta(n)$

iii. $x(n) = \sin(\omega n)$

2. Find the Z-transform and ROC of:

$$x(n) = nu(n)$$

$$x(n) = nu(n - 1)$$

$$x(n) = nu(n + 1)$$

3. Find the Z-transform and ROC of:

$$x(n) = e^{-an} \text{ for } n \geq 0$$

4. Find the Z-transform and ROC of:

$$x(n) = \begin{cases} 1 & \text{for } n < 0 \\ 0.5^n & \text{for } n \geq 0 \end{cases}$$

5. Find the Z-transform and ROC of:

$$x(n) = b^{|n|} \text{ for } b > 0$$